

What is claimed is:

1 1. A method of forming a linear photosensor array,  
2 comprising:

3 forming a plurality of packaged integrated circuits each  
4 including a linear array of photosensors within an exposed  
5 portion of the integrated circuit and a plurality of  
6 conductive leads adapted for soldering to a circuit board;

7 mounting the packaged integrated circuits with the  
8 exposed portions in alignment on a circuit board; and

9 soldering at least some of the leads for each packaged  
integrated circuit to the circuit board.

10 2. The method of claim 1, wherein the step of forming a  
11 plurality of packaged integrated circuits each including a  
12 linear array of photosensors within an exposed portion of the  
13 integrated circuit and a plurality of conductive leads adapted  
for soldering to a circuit board further comprises:

for each of the plurality of integrated circuit packages:

affixing an integrated circuit die to a lead frame;

connecting the integrated circuit die to selected  
portions of the lead frame with bond wires; and

encapsulating a portion of the lead frame and the  
integrated circuit die except for the exposed region,  
wherein the exposed region of the integrated circuit die  
remains exposed to external ambient light.

1 3. The method of claim 2, wherein the step of encapsulating  
2 a portion of the lead frame and the integrated circuit die  
3 except for the exposed region, wherein the exposed region of  
4 the integrated circuit die remains exposed to external ambient  
5 light further comprises:

6 after affixing the integrated circuit die to the lead  
7 frame and connecting the bond wires, mounting the lead frame

8 with the integrated circuit die and bond wires in a mold with  
9 a portion of the mold in contact with the exposed region of  
10 the integrated circuit die to prevent encapsulating material  
11 from adhering to the exposed region of the integrated circuit  
12 die.

1 4. The method of claim 3, wherein the step of mounting the  
2 lead frame with the integrated circuit die and bond wires in  
3 a mold with a portion of the mold in contact with the exposed  
4 region of the integrated circuit die to prevent encapsulating  
5 material from adhering to the exposed region of the integrated  
6 circuit die further comprises:

7 mounting the lead frame with the integrated circuit die  
8 and bond wires in a mold having a sloped surface adjacent to  
9 the portion of the mold contacting the exposed region of the  
10 integrated circuit die, wherein the sloped surface forms one  
11 surface of a mold cavity receiving the bond wires when the  
12 lead frame with the integrated circuit die is mounted in the  
13 mold.

1 5. The method of claim 1, wherein the step of forming a  
2 plurality of packaged integrated circuits each including a  
3 linear array of photosensors within an exposed portion of the  
4 integrated circuit and a plurality of conductive leads adapted  
5 for soldering to a circuit board further comprises:

6 mounting a plurality of integrated circuit die on a lead  
7 frame strip with a separation between the mounted integrated  
8 circuit die approximately equal to a kerf width for a  
9 singulation saw to be used in separating the packaged  
10 integrated circuits.

1 6. The method of claim 1, wherein the step of mounting the  
2 packaged integrated circuits with the exposed portions in  
3 alignment on a circuit board further comprises:

4 mounting adjacent packaged integrated circuits in contact  
5 with each other.

1 7. The method of claim 1, wherein the step of soldering at  
2 least some of the leads for each packaged integrated circuit  
3 to the circuit board further comprises:

4 soldering only leads on one side of each packaged  
5 integrated circuit to the circuit board, leaving leads on an  
6 other side of the packaged integrated circuits in floating  
7 contact with conductive structures on the circuit board to  
8 facilitate adjustment and removal of packaged integrated  
9 circuits.

1 8. An integrated circuit package for a linear photosensor  
2 array, comprising:

3 a lead frame including a die paddle and a plurality of  
4 leads;

5 an integrated circuit die affixed to the die paddle, the  
6 integrated circuit die including a plurality of photosensitive  
7 devices linearly aligned along a length of an upper surface of  
8 the integrated circuit die; and

9 packaging encapsulating a portion of the lead frame and  
10 the integrated circuit die except for a region of the  
11 integrated circuit die containing the photosensitive devices,  
12 wherein the region containing the photosensitive devices  
13 remains exposed through the packaging.

Sub 1  
14 9. The integrated circuit package of claim 8, wherein the  
15 die paddle of the lead frame is shorter than the integrated  
16 circuit die.

17 10. The integrated circuit package of claim 8, wherein the  
18 integrated circuit is affixed to the lead frame with an  
19 adhesive.

20 11. The integrated circuit package of claim 8, wherein the  
21 packaging does not cover ends of the integrated circuit die.

22 12. The integrated circuit package of claim 8, further  
23 comprising:

24 bond wires connecting the integrated circuit die to  
25 selected portions of the lead frame, wherein the packaging  
26 encapsulated the bond wires.

1 13. A linear photosensor array, comprising:  
2 a circuit board; and  
3 a plurality of packaged integrated circuits mounted on  
4 the circuit board, wherein each packaged integrated circuit  
5 includes an array of photosensors linearly aligned along a  
6 length of a surface region of an integrated circuit die  
7 therein and a plurality of conductive leads adapted for  
8 soldering to the circuit board,

9 wherein the packaged integrated circuits are mounted in  
10 a line on the circuit board with the surface regions of each  
11 packaged integrated circuit in alignment, and

12 wherein at least some of the leads for each packaged  
13 integrated circuit are soldered to the circuit board.

14. The linear photosensor array of claim 13, wherein the  
each of the integrated circuit packages further comprises:

15 an integrated circuit die affixed to a lead frame;  
16 bond wires connecting the integrated circuit die to  
17 selected portions of the lead frame; and

18 packaging encapsulating a portion of the lead frame, the  
19 integrated circuit die except for the surface region  
20 containing the array of photosensors and ends of the  
21 integrated circuit die, and the bond wires,

22 wherein the surface region of the integrated circuit die  
containing the array of photosensors remains exposed to  
ambient light.

1 15. The linear photosensor array of claim 13, wherein  
2 adjacent packaged integrated circuits on the circuit board are  
3 mounted in contact with each other such that the array of  
4 photosensors on each integrated circuit die form a single,  
5 long, continuous photosensor array.

1 16. The linear photosensor array of claim 13, wherein only

2 leads on one side of each packaged integrated circuit mounted  
3 on the circuit board are soldered to the circuit board, while  
4 leads on an other side of each packaged integrated circuit are  
5 left in floating contact with conductive structures on the  
6 circuit board to facilitate adjustment and removal of packaged  
integrated circuits.

Sub  
By  
Cmt

002060 5865980

1 17. A mold for packaging integrated circuits, comprising:  
2 a surface against which a lead frame strip may be placed,  
3 the surface including pins projecting therefrom which are  
4 received by tooling holes within a lead frame strip placed  
5 against the surface;

6 a plurality of cavity regions extending from the surface,  
7 each cavity region receiving an integrated circuit die affixed  
8 to the lead frame strip and bond wires connecting the  
9 integrated circuit die to the lead frame strip when the lead  
10 frame strip is placed against the surface, each cavity region  
11 formed by:

12 a first surface contacting a surface region of the  
13 integrated circuit die when the lead frame strip is  
14 placed against the surface and preventing encapsulate  
15 material from adhering to the surface region of the  
16 integrated circuit die, and

17 a sloped surface extending from the first surface of  
18 the cavity to form an area receiving the bond wires  
19 connecting the integrated circuit die to the lead frame  
20 strip when the lead frame strip is placed against the  
21 surface.

22 18. The mold of claim 17, wherein the plurality of cavity  
23 regions are contiguous and form a single cavity.